

ROUND PEN AND METHOD FOR INSTALLING THE SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation in part of prior copending application Serial No.: 10/345,461, filed January 17, 2003, and entitled "Ranch Fence."

BACKGROUND OF THE INVENTION

1. Field of the Invention:

The present invention relates to fencing for livestock and, more particularly, to a livestock pen preferably shaped in a circular disposition and to a method of making such a pen.

2. The Prior Art:

The prior art discloses numerous patents involving round fencing systems, fencing systems for livestock, cable tensioning systems, tubular fence systems and the like. However, the prior art fails to disclose the essence of the present invention which involves a plurality of vertical round tubular steel posts with a horizontal top rail of tubular steel arranged in the form of a round or oval pen, each pen being provided with a first end post, a second end post and a plurality of intermediate posts; each intermediate post having a series of "eyes" welded thereon through which a cable may pass to connect the posts together. The number of eyes is proportional to the height of the pen. The first end post and the second end post may be longer than the intermediate posts to allow for the addition of a U-shaped connector bar to fit atop the end posts to connect the two posts together. The cables are placed under tension, giving tension along the entire circumference of the pen to place the upper horizontal rails and the U-shaped connector bar under compression.

A preliminary search was conducted and the following listed patents were considered as broadly pertinent to the general subject matter.

<u>Patent No.</u>	<u>Inventor</u>	<u>Date</u>
2,139,642	Osolin	December 6, 1938
2,895,716	Veltri	July 21, 1959
349,377	White	September 21, 1886

Osolin Patent No. 2,139,642 discloses spring cable tensioners having rods contained therein to maintain tension, the rods comprising a bolt secured at each end, one end by the flat portion on the bolt, and the other end having a nut screwed thereon. The Osolin spring tensioners are designed primarily for use between posts in road blocks.

Veltri Patent No. 2,895,716 discloses a spring that provides strand tension. However, the Veltri patent relates to sections of a fence, not a single tension cable which extends the length of the pen. Rather, Veltri consists of various sections of fence which may be adjustable in height to compensate for uneven terrain or bodies of water located along the fence perimeter.

White Patent No. 349,377 discloses a wire fence having a cable tension structure which is broadly similar to that disclosed in the present application.

SUMMARY OF THE INVENTION

The present invention involves a round or oval pen designed primarily to enclose livestock such as horses or the like. The round pen consists primarily of a plurality of round vertical tubular steel posts provided with a rigid horizontal top rail, also of tubular steel. Each pen, more specifically, is provided with a first end post, a second end post, and a plurality of intermediate posts, each intermediate post having a series of "eyes" welded thereon through

which cables may pass to connect the posts together in a circular array. The exact number of eyes (and hence cables) will depend upon the desired height of the pen. The end posts may be longer than the intermediate posts to allow for the addition of a U-shaped connector bar designed to fit over these end posts so that there is continuous tension over the entire circumference of the pen. A standard gate can be installed between the end posts.

When the pen is installed, the vertical steel posts will be spaced equi-distant from one another with their lower ends being received in suitable holes in the ground. One end of a horizontal top steel rail is then inserted all the way into a corresponding opening in the top of the first end post. Thereafter, the other end of this top rail is inserted into a similar opening in the next adjacent intermediate post; the rail is slid into the intermediate post far enough to keep it from slipping out. The inserted end of the rail is secured in position in the intermediate post by means of a retaining pin which is dropped down through the upper end of the intermediate post and into a drilled hole in the rail. This retaining pin, which could be a double headed nail, for example, may be removed when replacing bent or damaged top rails. The use of the retaining pins provides an orderly and systematic method of assembly of the pen.

This process is repeated for each horizontal rail until all are set, then the posts are secured in place in the ground with cement or similar substance. Alternatively, the posts can be set directly into the ground without cement, if the owner desires to move the pen from one place to another from time to time. The retaining pins prevent the rails from sliding backwards and being removed. As indicated above, the use of the retaining pins facilitates easy replacement of the top rails in the event that a rail is damaged, as it requires no welding or other “permanent” attachment of the rails to the posts. Each vertical post can be provided with a cap.

Once the top rails are installed, the cable connectors are installed by attaching a multi coiled spring having a hook at each end thereof, first to an eye provided on the first end post and then to a curved metal guide (thimble) at the second end of the spring. The cable is then threaded through the thimble, with a remaining overlap of approximately 14" which overlapping portion is covered by a sliding sleeve and secured by a cable clamp. The remaining portion of the cable should be of sufficient length to traverse the circumference of the pen with excess for securing at the other end post. The cable is threaded through an eye on each intermediate post and, when the other end post is reached, it is threaded over another thimble provided with an eye-bolt. The eye-bolt is secured to the second end post by threading the bolt through the post and securing with a tension adjusting nut on the opposite side. The cable is then pulled tight with a tension tool and the tension is secured with a U clamp. The cable is then secured to itself via the same mechanism used above; i.e., the sleeve that covers the folded over portion of the cable to the cable itself.

The end result is a round or oval pen having a rigid horizontal top rail and a plurality of flexible horizontal cables which are spaced vertically and which create uniform tension along the pen's circumference. The flexible cable system is designed to be less damaging to an animal who gets a leg through the fence or who runs into the fence, and is designed such that any component which may become damaged can be easily replaced.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a plan view of a livestock pen made in accordance with the present invention and showing a gate in a partly open position.

Figure 2 is a partial elevation on an enlarged scale of one end post and associated cables taken along line 2-2 of Figure 1 and showing some of the springs in an expanded condition.

Figure 3 is a view similar to Figure 2, taken along line 3-3 of Figure 1 showing the connection of the cables to the other end post.

Figure 4 is a partial elevation taken along line 4-4 of Figure 1 showing three adjacent intermediate posts with the upper steel rail and five lower cable rails attached.

Figure 5 is a sectional view on an enlarged scale along section line 5-5 of Figure 1 showing how the cable passes through one of the eyes secured to an intermediate post.

Figure 6 is a front elevation on an enlarged scale of the gate and the two main posts as viewed along line 6-6 of Figure 1.

Figure 7 is a vertical sectional view taken along section line 7-7 of Figure 2 showing the details of connecting means employed with one of the cables and the first end post.

Figure 8 is a vertical sectional view taken along section line 8-8 of Figure 3 showing the details of connecting means employed with one of the cables and the second end post.

Figure 9 is a fragmentary sectional view of the upper end of the intermediate post to the left of the second end post, also showing the end of the top rail and its retaining pin.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring to the drawings in detail, Figures 1 and 6 show a round pen **10** for livestock such as cattle and horses. The pen consists of a first vertical post **12** suitably secured in the ground **14** by means of cement **16** or the like. A second end post **18** is mounted in spaced parallel relation with the first post **12** and is similarly secured in the ground by means of cement **16**. A swingable gate **20** is mounted between the two posts **12** and **18** to permit entry into the round pen **10** and also to permit the pen to be closed when the gate **20** is closed.

The pen **10** also includes a plurality of intermediate vertical posts **22** (see now Figure 4).

The posts **12** and **18** and the intermediate posts **22** are all round tubular steel posts. The space between each pair of adjacent posts is spanned by a horizontal top rail **24** of tubular steel. Each horizontal rail is provided with a vertical hole(s) adjacent each end to receive a retainer pin therein, as will hereinafter appear. Each intermediate post **22** is provided with a plurality of steel eyes **26** arranged vertically along the height of each intermediate post **22** and welded thereto. The eyes **26** permit a plurality of flexible cables **28** to pass horizontally through all of the eyes of all of the intermediate posts and to be placed under tension as will hereinafter appear. The exact number of eyes **26** (and cables **28**) will depend upon the desired height of the pen. In this particular case five such cables **28** are shown.

The first end post **12** and the second end post **18** may be longer (higher) than the intermediate posts to allow for the addition of a U-shaped connector bar **30**. The connector bar **30** has a top horizontal hollow steel member **32** and two vertical tubes **34** welded at right angles to the ends of the horizontal member **32**. The vertical tubular members **34** are slightly larger in internal diameter than the outer diameter of the posts **12** and **18** so that they can fit over these posts so as to connect these two posts together. Thus, the cables **28** and the U-shaped connector **30** are all under continuous tension along the entire circumference of the pen, as will hereinafter appear. The top rails **24**, on the other hand, are under continuous compression.

A standard gate **20** is connected in any convenient manner to the posts **12** and **18**. For example, a pair of hinge members **36** connect the left-hand end of the gate **20** to the second end post **18** for pivotal movement with respect thereto. The right-hand side of the gate can be secured to the first post **12** by means of a chain **38** and padlock **40**, or by any other convenient locking manner.

When the pen **10** is installed, the posts **12**, **18** and **22** are preferably spaced equi-distant from each other. The top rail **24** (made of tubular steel) is then inserted into a corresponding opening **42** in the second end post **18**. (The following sequence would be reversed if we started from the first end post **12**). The right end of the top rail **24** slides completely into the post **18** so that the left end thereof is opposite the opening **42** in the next adjacent intermediate post **22**. Thereafter, the top rail **24** is slid to the left so that the left hand end goes into the opening **42** of the intermediate post **22** as will appear from a consideration of Figure 9. A retaining pin (or nail) **43** is dropped into the upper end of the intermediate post **22** and into a hole (not referenced) located adjacent the left hand end of the rail **24** to keep the rail from slipping out of the post as shown in Figure 9.

Each intermediate post, as well as the end posts **12** and **18**, is provided with a hole **42** of sufficient size to accommodate the end of the top rail **24**. It should be understood that each hole **42** is of sufficient size to accommodate the rail with sufficient clearance for the rail to cant in the event that the pen traverses uneven ground. The process of inserting the top rail **24** into the intermediate rails is repeated for each rail until all are set. Then the posts are secured in place (in the ground) with cement or similar substance. Alternatively, the posts can be set directly into the ground without cement if the owner desires to move the pen from one place to another from time to time. Once the posts have been set, the cables are tensioned, as will be explained hereinafter, and the top rails slide toward each such that they abut each other at the center of each post. This tensioning of the cables produces a corresponding compression of all of the top rails **24** so as to provide sufficient rigidity and to prevent the pen **10** from collapsing.

The method of installing the top rails facilitates easy replacement of these top rails in the

event that a rail is damaged, as it requires no welding or other “permanent” attachment of the rails to the posts. Each post **22** can be provided with a cap **44** to cover the upper ends of the intermediate posts **22**.

The first end post **12** has a plurality of eyes **26** similar to, or the same as, the eyes **26** which are attached to the intermediate posts **22**. The cables **28** are preferably flexible steel cables covered with rubber or plastic coating. These cables are extremely strong and extend from the first end post **12**, through the eyes **26** of the intermediate posts **22** and back to the end post **18**. At the location of the first post **12**, the cables **28** connect to the post **12** by means of a plurality of multi-coiled springs **44**. Each spring has a hook at the left-hand end which fits into the eyes **26** on the end post **12** and another hook at the opposite end which fits into a curved metal guide (cable thimble) **46** around which the cable **28** extends. The other end of the cable **28** connects with the end post **18** through a series of eye-bolts **48** and a plurality of cable thimbles **46** around which the cable **28** is wound. The thimble **46** is inserted into the eye of the eye-bolt **48** before the cable **28** is wound around the thimble. The opposite end of the eye-bolt **48** is secured by means of a tension adjusting nut **50**.

When desiring to tighten the cable **28** around the entire pen, the free end **52** of the cable **28** is grasped or engaged by a cable tensioning tool (not shown), sometimes known as a “come-along” (or equivalent tensioning device) to pull the end **52** in a left-hand direction, for example, with respect to Figure 3. After the desired pull is reached, then the end **52** of the cable is secured against the remainder of the cable by means of a U-shaped clamp **54** which is tightened in a conventional manner. During the use of the cable tensioning tool, the end **52** is pulled in a maximum direction towards the left. When this maximum pull has been achieved and the clamp

54 has been tightened, then a flexible sleeve 56 made of rubber or plastic material is inserted over the free end 52 of the cable 28, so that the cable 28 and its end 52 are fully enclosed within the sleeve 56 as shown in lower portions of Figure 3.

Although the cable 28 is preferable pulled with respect to the end post 18, attention is directed to Figure 2 wherein the other end of the cable similarly engages a cable thimble 46 such that a free end 52 of the cable is provided at the other end of the cable. The free end 52 is secured to the cable 28 itself by means of a U-shaped clamp 54 and the exposed end of the cable 52 is covered by a slidable sleeve 56 which is slide toward the left as it relates to Figure 2. As shown in the bottom portion of Figure 2, the spring 44 can be expanded depending upon the force exerted on the cable 28.

As best shown in Figures 3 and 8, the eye-bolts 48 and the tension adjusting nuts 50 represent the “fine tuning” of the tensioning process. It should be further understood that the threaded shank of the eye-bolt 48 would be normally longer than that shown in Figure 3 and 8 so that the eye of the bolt would be spaced further to the left than as shown. Thus, the final increase in tension could be provided by turning the tension adjusting nut 50 to bring the “eye” closer to the post 18 and increase the tension in the cable 28. It might be necessary to make such slight adjustments from time to time to compensate for changes in cable tension resulting from weather changes or to assure proper cable tension to help prevent injury to the livestock. Following the fine tuning with the tension adjusting nut 50, it may be necessary to cut off any excess of the extended threaded shaft of the eye bolt 48.

Whereas the present invention has been described in particular relation to the drawings attached hereto, it should be understood that other and further modifications, apart from those

shown or suggested herein, may be made within the spirit and scope of this disclosure. Also, this invention should not be considered as limited by reference to specific details such as sizes, shapes, types of materials employed, etc. Suffice it to say that modifications that operate in the same manner as the preferred embodiments disclosed herein fall within the purview of this invention. The cables disclosed herein should be sufficiently strong to accommodate the tensions likely to be realized in a pen of the type designed to enclose livestock but at the same time should be sufficiently flexible to prevent or minimize injury to livestock when the latter come in contact therewith.

The top rails should be sufficiently strong to provide the rigidity desired as well as undergo and withstand the compressive forces to which they are subjected when the cables are tensioned.. The posts should be sufficiently rugged to withstand tensile, compressive and shear forces from the interconnecting elements.